

What is claimed is:

CLAIMS

1. An isolated, enriched or purified nucleic acid molecule encoding a PTP04 polypeptide.

2. The nucleic acid molecule of claim 1, wherein said nucleic acid molecule comprises a nucleotide sequence that

(a) encodes a polypeptide having the full length amino acid sequence set forth in SEQ ID NO:2;

(b) is the complement of the nucleotide sequence of (a);

(c) hybridizes under highly stringent conditions to the nucleotide molecule of (a) and encodes a naturally occurring PTP04 polypeptide;

(d) encodes a PTP04 polypeptide having the full length amino acid sequence of the sequence set forth in SEQ ID NO:2, except that it lacks one or more of the following segments of amino acid residues: 1-48, 49-294, 295-807 of SEQ ID NO:2;

(e) is the complement of the nucleotide sequence of (d);

(f) encodes a polypeptide having the amino acid sequence set forth in SEQ ID NO:2 from amino acid residues 1-48, 49-294, 295-807 of SEQ ID NO:2;

(g) is the complement of the nucleotide sequence of (f);

(h) encodes a polypeptide having the full length amino acid sequence set forth in SEQ ID NO:2, except that it lacks one or more of the domains selected from the group consisting of a signal peptide, an extracellular region, a transmembrane domain, a cytoplasmic domain, and a catalytic domain; or

(i) is the complement of the nucleotide sequence of (h).

3. The nucleic acid molecule of claim 1, wherein said nucleic acid molecule is isolated, enriched, or purified from a mammal.

4. The nucleic acid molecule of claim 3, wherein said mammal is a human.

5. The nucleic acid molecule of claim 1, further comprising a vector or promoter effective to initiate transcription in a host cell.

6. A nucleic acid probe for the detection of nucleic acid encoding a PTP04 polypeptide in a sample.

7. The probe of claim 6 wherein said polypeptide comprises at least 6 contiguous amino acids of the amino acid sequence shown in SEQ ID NO:2.

8. A nucleic acid molecule comprising one or more regions that encode a PTP04 polypeptide or a PTP04 domain polypeptide, wherein said PTP04 polypeptide or said PTP04 domain polypeptide is fused to a non-PTP04 polypeptide.

9. A recombinant cell comprising a nucleic acid molecule encoding either

- (a) a PTP04 polypeptide;
- (b) a PTP04 domain polypeptide; or
- (c) a PTP04 polypeptide or PTP04 domain polypeptide fused to a non-PTP04 polypeptide.

10. An isolated, enriched or purified PTP04 polypeptide.

11. The polypeptide of claim 10, wherein said polypeptide is a fragment of the protein encoded by the full length amino acid sequence set forth in SEQ ID NO:2.

12. The polypeptide of claim 10, wherein said polypeptide comprises an amino acid sequence having

- (a) the full length amino acid sequence set forth in SEQ ID NO:2;

(b) the full length amino acid sequence of the sequence set forth in SEQ ID NO:2, except that it lacks one or more of the following segments of amino acid residues: 1-48, 49-294, 295-807 of SEQ ID NO:2;

(c) the amino acid sequence set forth in SEQ ID NO:2 from amino acid residues 1-48, 49-294, 295-807 of SEQ ID NO:2; or

(d) the full length amino acid sequence set forth in SEQ ID NO:2 except that it lacks one or more of the domains selected from the group consisting of an N-terminal domain, a catalytic domain, and C-terminal domain.

13. An antibody or antibody fragment having specific binding affinity to a PTP04 polypeptide or a PTP04 domain polypeptide.

14. A hybridoma which produces an antibody having specific binding affinity to a PTP04 polypeptide.

15. A method for identifying a substance capable of modulating PTP04 activity comprising the steps of:

(a) contacting a PTP04 polypeptide with a test substance, and

(b) determining whether said substance alters the activity of said polypeptide.

16. A method for identifying a substance capable of modulating PTP04 activity in a cell comprising the steps of:

- (a) expressing a PTP04 polypeptide in a cell,
- (b) adding a test substance to said cells, and
- (c) monitoring a change in cell phenotype, cell proliferation, cell differentiation, PTP04 catalytic activity, or the interaction between a PTP04 polypeptide and a natural binding partner.

17. A method of preventing or treating an abnormal condition by administering to a patient in need of such treatment a compound that modulates the function of a PTP04 polypeptide.

18. The method of claim 17, wherein said abnormal condition involves an abnormality in PTP04 signal transduction pathway.

19. The method of claim 18, wherein said abnormal condition is cancer.

20. The method of claim 17, wherein said compound modulates the function of a PTP04 polypeptide *in vitro*.

21. A kit, comprising the compound of claim 17 and a protocol for the use of said compound.

22. The kit of claim 21, wherein said protocol is approved by the Food and Drug Administration.